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estimate of the number; there might not have been more than ten, yet, on the other hand, there might have been a hundred.

The phenomenon was witnessed by several other persons. It was public night at the observatory, and after looking at the nebula of *Orion* with the equatorial, we had stepped outside the observatory in order that I might point out to the visitors the location of the nebula. I had just pointed to the constellation, when all exclaimed at once upon the appearance of the meteors. Several other meteors moving in the same general direction were noticed during the evening, but no attempt was made to locate them accurately. From my recollection of their general direction, I should say that the radiant was somewhere in the neighborhood of the constellation *Aries*.

BERKELEY, CAL., April 9, 1899.

PLANETARY PHENOMENA FOR JULY AND AUGUST, 1899.

By MALCOLM MCNEILL.

JULY.

Mercury is an evening star throughout the month, and until the last week it sets more than an hour after sunset, so that it can probably be seen on almost any clear evening in the western twilight. It reaches its greatest eastern elongation on July 22d, and after that date it rapidly approaches the Sun.

Venus is still a morning star, but the interval between its rising and sunrise is growing smaller, and at the end of the month is only a little more than an hour. There will, however, be no difficulty in seeing it in the morning twilight, as the planet is much brighter than *Mercury*. It moves 41° eastward from *Taurus* to the extreme eastern part of *Gemini*.

Mars is still above the horizon in the early evening, but has ceased to be a conspicuous object. It moves 17° eastward and 8° southward from *Leo* into *Virgo*, and on the evening of July 29th passes very close to the third-magnitude star *β Virginis*, the distance being a little greater than the limit of naked-eye separability. At the close of the month the planet's distance from the Earth is more than double the Earth's distance from the Sun.

Jupiter is still in fair position for evening observation in the southwesterly sky. It is on the borders of *Virgo* and *Libra*, and moves about 1½° eastward during the month. It is in quadration with the Sun on July 24th.

Saturn has reached good position for evening observation, being well above the horizon at sunset. It is in the southern part of *Ophiuchus*, between *Scorpio* and *Sagittarius*, and moves westward about 2° during the month. The rings are at nearly their maximum opening.

Uranus is also well placed for evening observation, being above the horizon until after midnight. It is in the constellation *Scorpio*, and moves about 1° westward. At the close of the month it is 2° east and 1° 20′ south of the third-magnitude star *β Scorpii*.

Neptune is a morning star near the Sun.

AUGUST.

Mercury is an evening star at the beginning of the month, rapidly approaches the Sun, passes inferior conjunction on the morning of August 19th, and becomes a morning star. For the last few days of the month it rises more than an hour before sunrise, and may be seen in the early morning twilight. It is in conjunction with *Venus* on August 21st, but both planets are too near the Sun for naked-eye visibility.

Venus is still a morning star, but is drawing very close to the Sun, and at the end of the month rises less than half an hour before sunrise. It can scarcely be seen during the latter half of the month.

Mars is also nearing the Sun, and at the close of the month it sets about an hour and a half after sunset. This short interval, combined with the planet's great diminution of brightness, will make it very difficult to see after the middle of the month. It is in *Virgo*, and moves 17° eastward and 8° southward, and at the end of the month is 5° west and 4° north of *Spica*.

Jupiter sets about two hours earlier than during the corresponding date in July, and at the end of the month is below the horizon at 9 P. M. It is in *Libra*, and moves 4° eastward and 1° southward toward the brightest star of the constellation.

Saturn remains in good position for observation in the southern and southwestern sky in the evening. It is on the border of *Ophiuchus* and *Scorpio*, and moves very little during the month.

Uranus is also nearly stationary, and keeps its position relative to *β Scorpii*. It sets about an hour earlier than *Saturn*.

Neptune is in *Taurus*, and at the end of the month rises just before midnight.

PHASES OF THE MOON, P. S. T.

		H. M.		H. M.
New Moon,	July 7,	12 31 P. M.	Aug. 6,	3 48 A. M.
First Quarter,	July 15,	3 59 P. M.	Aug. 14,	3 54 A. M.
Full Moon,	July 22,	1 41 P. M.	Aug. 20,	8 45 P. M.
Last Quarter,	July 29,	4 42 A. M.	Aug. 27,	3 57 P. M.

THE SUN.

1899.	R. A. H. M.	Declination. ° ′	Rises. H. M.	Transits. H. M.	Sets. H. M.
July 1.	6 41	+ 23 7	4 40 A.M.	12 4 P.M.	7 28 P.M.
11.	7 22	+ 22 7	4 46	12 5	7 24
21.	8 2	+ 20 29	4 53	12 6	7 19
Aug. 1.	8 46	+ 18 1	5 3	12 6	7 9
11.	9 24	+ 15 16	5 12	12 5	6 58
21.	10 1	+ 12 7	5 21	12 2 P.M.	6 43
31.	10 38	+ 8 38	5 31	12 0 M.	6 29

MERCURY.

July 1.	7 59	+ 22 30	6 1 A.M.	1 22 P.M.	8 43 P.M.
11.	9 4	+ 17 43	6 45	1 47	8 49
21.	9 50	+ 12 20	7 11	1 54	8 37
Aug. 1.	10 16	+ 7 34	7 10	1 36	8 2
11.	10 10	+ 6 23	6 29	12 51	7 13
21.	9 41	+ 9 33	5 10	11 43 A.M.	6 16
31.	9 33	+ 13 13	4 9	10 55	5 41

VENUS.

July 1.	5 11	+ 22 16	3 14 A.M.	10 34 A.M.	5 54 P.M.
11.	6 4	+ 23 10	3 23	10 47	6 11
21.	6 57	+ 22 57	3 37	11 0	6 23
Aug. 1.	7 55	+ 21 25	3 58	11 15	6 32
11.	8 46	+ 18 57	4 20	11 27	6 34
21.	9 36	+ 15 34	4 43	11 37	6 31
31.	10 24	+ 11 28	5 6	11 46	6 26

MARS.

July 1.	10 43	+ 9 13	9 33 A.M.	4 5 P.M.	10 37 P.M.
11.	11 4	+ 6 52	9 24	3 47	10 10
21.	11 26	+ 4 24	9 15	3 30	9 45
Aug. 1.	11 51	+ 1 37	9 6	3 11	9 16
11.	12 13	— 0 58	8 57	2 54	8 51
21.	12 37	— 3 36	8 50	2 38	8 26
31.	13 0	— 6 13	8 43	2 22	8 1

JUPITER.

July	1.	13 55	— 10 27	1 52 P.M.	7 16 P.M.	12 40 A.M.
Aug.	1.	14 1	— 11 11	11 59 A.M.	5 21	10 43 P.M.
Sept.	1.	14 17	— 12 39	10 17	3 34	8 51

SATURN.

July	1.	17 13	— 21 33	5 50 P.M.	10 33 P.M.	3 16 A.M.
Aug.	1.	17 6	— 21 29	3 42	8 25	1 8
Sept.	1.	17 5	— 21 34	1 39	6 22 P.M.	11 5 P.M.

URANUS.

July	1.	16 11	— 20 59	4 47 P.M.	9 32 P.M.	2 17 A.M.
Aug.	1.	16 8	— 20 53	2 47	7 32 P.M.	12 17
Sept.	1.	16 9	— 20 54	12 41	5 26	10 11 P.M.

NEPTUNE

July	1.	5 39	+ 22 7	3 37 A.M.	10 57 A.M.	6 17 P.M.
Aug.	1.	5 43	+ 22 9	1 45	9 4	4 23
Sept.	1.	5 46	+ 22 9	11 46 P.M.	7 5	2 24

ECLIPSES OF *JUPITER'S* SATELLITES, P. S. T.

(Off right-hand limb as seen in an inverting telescope.)

			H.	M.					H.	M.	
I, R,	July	5.	10	33	P.M.	II, D,	Aug.	1.	4	12	P.M.
II, D,		7.	7	2		II, R,		1.	6	28	
I, R,		14.	6	57		I, R,		6.	7	10	
II, D,		14.	9	39		II, D,		8.	6	49	
III, R,		20.	5	53		II, R,		8.	9	5	
I, R,		21.	8	51		I, R,		13.	9	4	
III, D,		27.	8	26		II, D,		15.	9	26	
III, R,		27.	9	52		II, R,		15.	11	41	
I, R,		28.	10	46		I, R,		22.	5	28	
I, R,		30.	5	15							